with this method of anesthesia lies in the possibility of sepsis to the spinal canal. Therefore I would not attempt spinal anesthesia in a private dwelling. In the hospital I have the patients in whom spinal anesthesia is to be made prepared as for a laparotomy. The day before the operation the patient gets a full bath, his back is shaved and a sublimate-pad applied upon it. On the operating table the field of the puncture is sterilized as carefully as the site of an abdominal section.

I hope you will test this method unbiasedly in your genito-urinary surgical work, so that well established indications for this method of anesthetizing may be drawn from for future experience. My work teaches me that the method seems to be impracticable in very nervous and excitable patients. I can highly recommend it, though, for old and decrepit individuals where a weak heart or unreliable kidneys would contra-indicate a general anesthesia. I have not had a mishap in my spinal anesthesia with tropa-cocaine so far, and I consider this method not to be more dangerous than any other form of anesthetizing, while its advantages over general anesthesia for the patient are unquestionable.

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ON PTOMAINE POISONING.*

By E. O. JELLINEK, M. D.

Visiting Physician to the German Hospital, San Francisco.

PTOMAINE poisoning, with exclusive or prevailing gastro-intestinal symptoms of lesser or greater severity, is not of rare occurrence in medical practice.

The symptoms are those of a more or less pronounced gastro-intestinal catarrh, with general feeling of malaise, epigastric pressure, regurgitation and vomiting of sour or bitter particles, and also diarrhea. In the medium and more severe cases the above symptoms are accompanied by secretory disturbances, characterized by dryness of the skin and mucous membranes.

In addition, we find nervous disturbances, which demonstrate themselves in different gradations of bulbar symptoms. These last-named cases are fortunately rare, and it is my purpose to present the differential diagnosis of these, based upon the material about to be given.

In a boarding-house of this city, seven persons became sick within nine days, three of whom died. The eating of tainted boiled beef on the 27th of November was given as the cause of the sickness. From two of the fatal cases, which were not under my care, I obtained the following histories:

Case 1. **The patient became sick two days after eating the meat, with symptoms of general muscular weakness, dryness in the throat and difficulty in swallowing. Died after two days.**

Case 2. **The patient became sick four days after eating the meat, with symptoms of general prostration, dryness in the throat, difficulty in swallowing, diplopia, ptosis. Died in six days.**

I had under my observation five cases, one of the patients dying, the other four recovering.

The history of these are briefly as follows: On the 6th of December Dr. H. and his wife visited me in my office.

Case 3. Dr. H. had complained for six days past of tiredness, dizziness, lack of appetite, pronounced weakness in the legs, causing inability to walk two blocks; of heaviness of the arms, of dryness of the mouth.

Case 4. Mrs. H. complained of practically the same symptoms, with the exception that the dryness in her throat was more pronounced and she had difficulty in swallowing; slight ptosis, and constipation.

Case 5. On the 8th I was called to see Mrs. C. She had felt ill for several days, remaining in bed, and at the time of my visit she still complained of general muscular weakness and lack of desire to get up; lack of appetite, constipation, scratching and dryness in the throat.

Case 6. Mr. T. called upon me on the 9th of December. He complained of general tiredness, great muscular weakness, making it difficult for him to walk; constipation, and had no desire to work. He had also, for several days previously, felt dryness in his throat; nausea and dizziness.

Case 7. On the night of the 10th of December I was called to the Homeopathic Sanitarium to examine Mr. G., who had become sick on the 3rd of December. He had been in the Sanitarium for five days with a diagnosis *in suspenso*. The history which I could obtain was as follows:

The patient became sick with symptoms of pronounced prostration, lack of appetite, dryness and scratching in the throat. He could open his eyes only with difficulty. He was constipated; no urinary disturbances, no headache. On the following day difficulty in swallowing was present, which increased to actual inability to swallow, accompanied by increasing dryness of the mouth and pharynx and great thirst. The voice became hoarse, breathing and pulse quickened. No food had been taken for five days, owing to difficulty in swallowing and coughing caused by particles of food lodging in the larynx.

Examination gave the following status: Well-built man of average height and musculature, with slight panniculus adiposus. No edema. The patient rested in a passive, half-sitting posi-

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tion in bed; the head dropped over his right shoulder. The skin was pale and dry, expression of the face crestfallen. The eyes were closed, and the eyelids could be raised, with great effort, about one cm. Eye movements free; no diplopia; no disturbance of the facial or trigeminus nerves. The tongue could be voluntarily stretched out and moved in all directions, still the movements were retarded. The patient could whistle; there was no atrophy of the tongue or lips. The uvula was raised only slowly, the pharyngeal reflexes sluggish. The speech was low and hoarse, and distinctly nasal, often unintelligible. The principal complaints of the patient were the severe dryness of the throat and the inability to swallow. I gave the patient, with his head down, a teaspoonful of milk to swallow, but he began immediately to cough. The cough sounded weak. In his breathing I heard a tracheal gurgle, but no phlegm could be raised. By allowing the patient to hang his head out of the bed till it touched the floor, a slight amount of mucus was expectorated. The tongue and mucous membrane of the mouth were dry, with small ulcerations. Temperature 102, pulse ranged between 120 and 140. Breathing shallow—36 per minute. There was slight dullness at the base of the right lung, with small, moist rales. Sensorium undisturbed. As I was asked to take charge of the patient, I had him brought the next morning to the German Hospital.

The status taken on the 11th was practically the same. The prostration was even more pronounced, the patient not having slept, although one-fourth of a grain of morphine had been administered. In fact, since the beginning of his illness the patient had slept scarcely two hours.

The examination of the urine gave s. g., 1021; slightly acid; nucleo-albumin present; serum-albumin a trace; no casts. Dullness and rales increased in the right lung. Temperature, 101.6; pulse, 140.

Therapy: 500 cc. saline infusion hypodermatically; stomach lavage; 0.5 calomel by mouth; high irritations. (I did not care to risk venesection, owing to weak heart.)

Great care was taken to properly wash out the mouth, and food was introduced by stomach tube only.

On the 12th of December the patient, after being given hypodermatically one-fourth of a grain of morphine, slept four hours. He felt better and more hopeful. He could open his eyes a little wider. Swallowing was still nugatory, otherwise *status idem*. Therapy continued as before.

At four o'clock on the morning of the 13th the patient died suddenly.

The post-mortem was performed by Dr. Ophüls the same day at the Coroner's office. His report is as follows:

AUTOPSY.

Mr. Goodyear—Strongly built, very muscular, moderately well-nourished, man of middle age, extreme pallor of skin and mucous membranes. No edema; no edema of superficial lymphatic glands. Very marked rigor mortis. Small, round exostosis, about 1½ c. m. in diameter, present in middle of left parietal bone. Dura mater a little tense; larger veins in diploe of skull are filled, in the longitudinal sinuses a considerable amount of fluid blood and a few small clots.

The pia mater is hyperemic and a little edematous on both sides; convolutions on the right side are slightly flattened, a moderate amount of Pacchionian granulations along the longitudinal fissure. The same hyperemia of pia mater at base of brain; large blood-vessels at base of brain are normal; a very large amount of dark fluid blood at sinuses at the base of brain. Half a teaspoonful of blood-stained fluid in the left lateral ventricle, marked hyperemia and slight edema. Conditions exactly the same on the other side. Sella turcica and plexuses hyperemic. The third ventricle is normal. Bottom of fourth ventricle shows a few hyperemic veins (small), no hemorrhages present. Cerebellum hyperemic and edematous; basal ganglia hyperemic. No hemorrhage anywhere.

Marked edema of soft tissues at lower part of chest. Peritoneum slightly hyperemic; about a teaspoonful of clear fluid in recto-vesical pouch, but little fat present in the omentum. Diaphragm at fifth rib on both sides. The liver projects two-finger breadths in mammary line on the right side; a considerable part of the middle portion of left lobe of the liver is exposed.

In left pleura there is about 100 c. cm. of slightly blood-stained fluid; in right pleura about 200 c. cm. of more intensely stained fluid—no adhesions. Remnant of thymus gland present; a teaspoonful of fluid present in pericardium, the veins of which are much injected. Heart is of normal size; right ventricle dilated, left ventricle in moderate contraction; much fluid blood and a few small clots present in pulmonary artery; valves normal, a few yellow spots in aorta and in right coronary artery; heart muscle very cyanotic and edematous. From cut ends of the large blood vessels a large quantity of dark blood is discharged.

A number of small petechie in the posterior part of pleura of left lung; very marked passive congestion, edema and collapse of posterior part of left lung. The entire lung is more or less edematous. Very marked hyperemia of mucous membrane of bronchial tubes, which contain foamy, bloody fluid. Extensive collapse of posterior part of upper lobe of left lung.

Right lung is in very much the same condition, plus some small broncho-pneumonic patches scattered through the middle lobe in the posterior part.

Spleen slightly enlarged, and the pulp is full of dark ,almost black, venous blood; organ is quite hard.

Left adrenal normal; left kidney, very marked cyanosis and some edema, no visible lesions. Right kidney same as left.

Bile duct patulous, pylorus also; passive congestion of mucous membrane of stomach. Pancreas in marked passive congestion. Liver enlarged; gall bladder and contents normal; liver shows very marked passive congestion and is edematous—slight enlargement—and hyperemia of retroperitoneal and mesenteric lymphatic nodes.

In the small intestine there is a moderate amount

c. feces of absolutely normal appearance. In large intestine there is bright yellow semi-fluid material; mucous membrane of intestines perfectly normal, except for marked passive congestion and a little swelling in the upper part of jejunum. No swelling of lymphoid particles.

Microscopical examination of stained specimens of medulla pons and cerebellum showed all capillaries overfilled with blood.

Let us now examine these cases critically in order to ascertain what differential diagnostic points can be brought out.

In the first place, there is no doubt there was a local epidemic in the house mentioned, as we are accustomed to see after tainted sausage or meat has been eaten.

The entire absence of fever, of cholera-like diarrhea with cramps in the calves, of cyanosis, of carbuncles, excludes the diagnosis of anthrax. On the other hand, the nervous and secretory disturbances point to baccilus botulinus infection. The typical picture of botulismus is briefly as follows:

In addition to the intestinal sypmtoms already mentioned, early diminution in the secretory function occurs, which demonstrates itself through absence of perspiration, through diminished or absent salivary secretion, causing dryness and ulcer formations in the mouth and throat. The dryness of the respiratory tract causes the hoarseness of the voice and the croup-like cough; the dryness of the intestinal tract produces constipation. These symptoms are dependent on paralysis of the secretory nerves or their centers. Besides, we have disturbances in the course of the cerebral nerves. Patients often complain of seeing films, colors, and of diplopia. The movements of the eye muscles are often impeded, the pupil dilated and reacting sluggishly. Very often we find paralysis of the levator palpebra superioris, causing ptosis, this sign being particularly pathognomonic for botulismus. Often enough we find involvement of the hypoglossus and glosso-pharyngeal nerves, causing well-known symptoms. I wish here to emphasize that I do not attribute the complete aphonia and aphagia as much to the bulbar involvements as to the dryness of the mouth, pharynx, esophagus, trachea and bronchial tubes. As a result of the diminished sensibility of the isthmus faucium and pharynx particles of food get into the trachea with consequent aspiration-pneumonia. Of the cerebral symptoms, I mention headache, vertigo, and great apathy.

The muscular weakness is very pronounced. Most always there is present a feeling of thirst, sometimes of hunger. The voidance of urine is undisturbed.

The disease can result in death in a few hours, or a few days, or may linger for months, with alternate intervals of improvement or retardation. To be sure, many cases recover; still the mortality is between 20 and 40 per cent.

The confusion of this disease with acute bulbar paralysis is, in my opinion, to be excluded for the following reasons:

Primarily, we have in botulismus a paralysis of the secretory nerves or centers, which never occurs in acute bulbar paralysis. You will remember that in bulbar paralysis the saliva flows out of the mouth. The lips in botulismus are not paralyzed—a constant symptom of bulbar paralysis, in the same way as ptosis is in almost constant symptom of botulismus. Furthermore, the acute bulbar paralysis is almost always combined with paralysis of one or more limbs, while in botulismus such paralysis is absent; and we only occasionally find paresthesia in fingers or toes. In addition the epidemic occurrence negatives acute bulbar paralysis.

The therapy depends principally upon eliminating the poison as quickly as possible from the stomach and intestinal tract through stomach lavage and purgatives, the best of which is calomel. If the symptoms are those of paralysis of the secretory functions, so that we must conclude the poison has been carried into the circulation, then we should resort to venesection and saline infusion. On the theory of paralysis of the secretory functions, it seems wise to me to try diaphoresis by means of steam or pilocarpin. I scarcely believe that a diaphoretic attempt in bed with steam or pilocarpin would be injurious to the patient, if the heart is not too weak, and arguing from the beneficial results obtained by this measure in uremia it might be of even life-saving value in this disease. To prevent inanition and aspiration-pneumonia, food should only be given by stomach tube. The hygiene of the mouth and skin should be carefully observed. Against sleeplessness morphin subcutaneously should be given, and for threatening heart failure the usual cardiac stimulants should be employed.

At the monthly meeting of the Hawaiian Medical Association on Saturday evening, December 6th, the pestiferous mosquito was on the board for dissection. Dr. Sloggett, president, read a paper on the subject, which was followed by a discussion. No definite line of public action was suggested, the idea being to bring the matter into agitation.

President Sloggett's paper gave a resume of the experiments conducted on the Atlantic coast, which had achieved considerable results of a satisfactory nature. The remedies for the pest were drainage, the filling of swamps and the application of petroleum to stagnant water. Reference was made to the great difficulty recognized as lying in the way of remedial measures here, from the rice and taro fields in the vicinity.